

Montana Board of Oil and Gas Conservation Environmental Assessment

Operator: Brigham Oil & Gas, L.P.
Well Name/Number: Voss 11-14 #2-H
Location: NE NE 11 T25N R59E
County: Richland, MT; Field (or Wildcat) Wildcat

Air Quality

(possible concerns)

Long drilling time: No, 30-40 days drilling time.

Unusually deep drilling (high horsepower rig): Triple derrick rig 20,343' MD/10,309' TVD Bakken Formation horizontal well test.

Possible H₂S gas production: Slight possibility of H₂S gas production.

In/near Class I air quality area: No Class I air quality area.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: _____

Comments: Associated gas to be flared or if a pipeline is run to a gathering facility then it can be hooked up.

Water Quality

(possible concerns)

Salt/oil based mud: Yes to intermediate string hole, oil based invert drilling fluids. Horizontal lateral will be drilled with brine water. Surface casing freshwater, and freshwater mud system to be used.

High water table: Possible high water table.

Surface drainage leads to live water: No, closest drainages is an unnamed ephemeral tributary drainage to the Missouri River, adjacent to the northeast corner of this well location. Missouri River is about 2.5 miles to the northeast from this location.

Water well contamination: None, closest water wells in the area are about 1/4 of a mile to the northeast about 3/8 of a mile to the southwest and about 3/4 of a mile to the southeast and all other wells are 1 of a mile and further from this location. Depth of these domestic and stock water wells range from 40' to 1445'. Shallower than the surface casing setting depth of 1500'. Recommend setting 1585' of 9 5/8" surface casing to set 50' past the Base of the Fox Hills Formation.

Porous/permeable soils: Yes, sandy silty clay soils.

Class I stream drainage: No, Class I stream drainages nearby.

Mitigation:

☒ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☐ Closed mud system

☐ Off-site disposal of solids/liquids (in approved facility)

☐ Other: _____

Comments: 1585' surface casing should be set to get below freshwater zones in adjacent water wells. Also, covering Fox Hills aquifer. Adequate surface casing and BOP equipment to prevent problems in and around freshwater drainage.

Soils/Vegetation/Land Use

(possible concerns)

Steam crossings: None anticipated, crossing only ephemeral drainages.

High erosion potential: No, location will require a small cut of up to 7.1' and small fill, up to 1.5', required.

Loss of soil productivity: None, location to be restored after drilling well, if nonproductive. If productive unused portion of wellsite will be reclaimed.

Unusually large wellsite: No, large well site 484'X484'

Damage to improvements: Slight, surface use is cultivated land.

Conflict with existing land use/values: Slight

Mitigation

☐ Avoid improvements (topographic tolerance)

☐ Exception location requested

☒ Stockpile topsoil

☐ Stream Crossing Permit (other agency review)

☒ Reclaim unused part of wellsite if productive

☐ Special construction methods to enhance reclamation

☒ Other Requires DEQ General Permit for Storm Water Discharge Associated with Construction Activity, under ARM 17.30.1102(28)

Comments: Will use existing county roads, #355, #356 and #141. About 1693' of new access road will be built into this location off existing north-south county road.. Cuttings will be solidified with fly ash and buried in the lined reserve pit. Oil base invert drilling fluids will be recycled. Completion fluids will be removed and hauled to commercial Class II Disposal. The pit after solidification will be covered with subsoil and topsoil finish, if well is productive. If well is not productive subsoil will be spread and topsoil will be spread on top of the subsoil. No concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Residences about ¼ of a mile to the northeast, ½ of a mile to the west southwest, ¾ of a mile to the east northeast and 1 mile to the east southeast from this location. Town of Nohly, Montana is about 3 miles to the northwest and the town of Dore, North Dakota is about 2 miles to the southeast from this location.

Possibility of H2S: Slight

Size of rig/length of drilling time: Triple drilling rig 30 to 40 days drilling time.

Mitigation:

☒ Proper BOP equipment

☐ Topographic sound barriers

☐ H2S contingency and/or evacuation plan

☐ Special equipment/procedures requirements

☐ Other _____

Comments: Adequate surface casing cemented to surface with working BOP stack should mitigate any problems. Sufficient distance between location and buildings noise should not be a problem.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover. Candidate specie is the Greater Sage Grouse and Sprague's Pipit. NH Tracker website lists one (1) species of concern: Whooping Crane.

Mitigation:

- ☐ Avoidance (topographic tolerance/exception)
- ☐ Other agency review (DFWP, federal agencies, DSL)
- ☐ Screening/fencing of pits, drillsite
- ☐ Other: _____

Comments: Private cultivated surface lands. No live water nearby. There maybe species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites: None identified.

Mitigation

- ☐ avoidance (topographic tolerance, location exception)
- ☐ other agency review (SHPO, DSL, federal agencies)
- ☐ Other: _____

Comments: Surface location is private cultivated land. There maybe possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

- ☐ Substantial effect on tax base
- ☐ Create demand for new governmental services
- ☐ Population increase or relocation

Comments: Wildcat Bakken Formation horizontal well. No concerns.

Remarks or Special Concerns for this site

20,343' MD/10,309' TVD Bakken Formation horizontal well test. No concerns.

Summary: Evaluation of Impacts and Cumulative effects

Short term impacts expected, no long term impacts anticipated.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki
(title:) Chief Field Inspector

Date: September 21, 2011

Other Persons Contacted:

Montana Bureau of Mines and Geology, Groundwater Information Center GWIC
website

(Name and Agency)

Richland County water wells

(subject discussed)

August 27, 2011

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA
COUNTIES, Richland County

(subject discussed)

August 27, 2011

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S3, T25N R59E

(subject discussed)

August 27, 2011

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____